

REMARKS

Claims 1-27 are currently pending in this application. Claims 16-24 have been cancelled.

Claim Objections

Claims 1-3, 7, 12 and 15 stand objected to because of informalities. In particular, the Action asserts that Claim 3 should depend from Claim 2, Claim 7 should depend from Claim 1 and Claim 15 should depend from Claim 12. Applicants have amended the claims to correct the dependencies as requested in the Office Action. Withdrawal of this objection is therefore respectfully requested.

37 C.F.R. §103 Rejections

Claims 1, 2 and 4-15 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,660,811 to Ogura et al. ("Ogura"). Claim 3 stands rejected under 35 U.S.C. §103(a) as being obvious over Ogura in view of U.S. Patent No. 5,476,716 to Gallo et al. ("Gallo"). Claims 1-5 stand rejected under 35 U.S.C. § 103(a) as being obvious over Gallo, above, in view of U.S. Patent No. 5,760,146 to von Gentzkow et al. ("von Gentzkow") or U.S. Patent No. 6,500,546 to Heine et al. ("Heine"). Applicants respectfully traverse each of these rejections.

The present invention provides a composition which is particularly useful as a flame-retardant in molding compositions for use in coating electronic or electrical devices. The composition includes an epoxy resin, melamine cyanurate, and a transition metal oxide containing an oxyanion of a Group VIA element.

In the Action, the Examiner admits that Ogura does not teach the use of a combination of compounds to impart flame retardance, let alone the specific combination of a Group VIA metal oxide, such as tungsten oxide, and melamine cyanurate as recited in the present claims. Ogura merely presents a lengthy laundry list of suitable compounds which provide flame retardance, any one of which can be used in the compositions described therein. There is absolutely no suggestion in Ogura to use more than one compound for this purpose, nor any guidance as to particular combinations, out of the many compounds disclosed, which might provide an improved ability to impart flame retardance. The present invention, however, specifically claims the use of a combination of two specific flame

retardants, a Group VIA metal oxide and melamine cyanurate, to impart flame retardance in molding compositions.

Applicants prior response included a Declaration Under 37 C.F.R. § 1.132, further demonstrating that the claimed combination has surprisingly been found to provide a synergistic result, namely, a significant and unexpected improvement in flame retardance achieved through the combination of a Group VIA metal oxide and melamine cyanurate, as compared with the use of either compound individually. The Office Action contends that the Declaration fails to provide a proper comparison due to the difference in the total amount of flame retardant in the compared samples.

To address these issues raised in the Action, Applicants submit herewith the second Declaration of Anthony Gallo, Ph.D., a named inventor on the present application, in further support of this unexpected result. As suggested by the Examiner in the Office Action, Dr. Gallo carried out additional experiments testing the flame-retardant abilities of the compounds presently claimed in the molding compositions of the present invention. This testing was carried out to specifically address the Examiner's concerns in the Office Action: 1) that identical amounts of silica were not used in all the samples; and 2) that all samples did not have 10 parts of flame retardant compound. Data from these tests is presented in Table 1, attached in the second Declaration. As can be seen in Table 1, Samples A-C each have 10 parts of flame retardant. In particular, molding compositions were made comparing a composition according to the present invention including a combination of tungsten oxide and melamine cyanurate (Sample A) with compositions including a flame retardant of only tungsten oxide (Sample B) or melamine cyanurate (Sample C) at the same amount. As also can be seen from the results shown in Table 1, the molding composition with the combination of compounds provided substantial flame retardance as compared to either compound used alone. In fact, Sample B with tungsten oxide alone failed the burn test completely, and Sample C, having melamine cyanurate alone, resulted in a composition with practically no flow, therefore producing a compound which is unworkable and could not be tested. Moreover, as demonstrated through the Examples of the specification as well as the prior § 132 Declaration dated October 12, 2004, when melamine cyanurate is used as the sole flame retardant at a level which provides a useful flowable product, the flammability of such a product is inferior when compared with the inventive composition. Such results could not have been predicted, based on the teaching of the cited references. Applicants respectfully

submit that Claims 1-15 are not obvious in view of the cited references, and request withdrawal of this basis of rejection.

With respect to the combination of Ogura with Gallo, Gallo is apparently cited for the teaching of a specific tungsten oxide, namely, tungsten trioxide. Gallo teaches a molding composition having a combination of a metal oxide and a halogen-containing organic compound for imparting flame retardance. As set forth above, the primary reference Ogura teaches neither a combination of compounds for providing flame retardance, nor the specific combination presently claimed, namely melamine cyanurate in combination with a Group VIA metal oxide. Gallo does not add anything to the deficiencies of these teachings, and therefore these references cannot be combined to arrive at the present invention. Applicants respectfully request withdrawal of this basis of rejection as well.

Gallo has also been cited in the Action as a primary reference, in combination with von Gentzkow and Heine. In particular, Von Gentzkow and Heine are cited for teaching molding compounds of epoxy resin containing melamine cyanurate; Gallo, as discussed above, is cited for a teaching of a molding compound using tungsten oxide as a flame retardant. Von Gentzkow teaches a molding compound with a phosphorus-modified epoxy resin for flame retardance, the molding compound having optional additives such as melamine cyanurate. Heine teaches a molding composition comprising a bi- or polyfunctional resin, a phosphorus containing compound for flame retardance, a curing agent and a curing catalyst, with optional additives such as melamine cyanurate. There is no teaching of a combination of compounds to provide improved flame-retardant properties.

Neither von Gentzkow nor Heine teaches a combination of compounds to provide improved flame retardance in a molding compound, as claimed in the present invention. As noted in the second Declaration, the combination of tungsten oxide and melamine cyanurate provides unexpectedly improved results. This could not have been predicted, based on the teachings of any of the cited references.

Claims 23-24, currently withdrawn, are likewise patentable for the same reasons discussed above. Ogura does not teach a method of imparting flame retardance in a molding composition through the use of a combination of compounds as set forth in these claims.

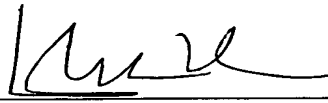
Application No. 10/644,791
Amendment Dated April 12, 2005
Reply to Office Action of January 13, 2005
Attorney Docket No. 3833-030392 (LDEO-108)

Based on the foregoing amendments and remarks, it is apparent that the improved flammability achieved through the specific combination of compounds is entirely unexpected when compared with either compound alone. Reconsideration of the rejections and allowance of all of the pending claims are therefore respectfully requested.

Should the Examiner wish to discuss any of these issues in further detail, the Examiner is invited to contact Applicants' undersigned representative by telephone at 412-471-8815.

Respectfully submitted,

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